BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Application of	)	
	)	
PUBLIC UTILITIES COMMISSION	)	DOCKET NO. 2008-0273
	)	
Instituting a Proceeding to Investigate the Implementation of Feed-in Tariffs.	)	
	)	
	)	
	)	

THE SOLAR ALLIANCE'S RESPONSES TO INFORMATION REQUESTS FROM HAWAIIAN ELECTRIC COMPANY AND THE DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT AND TOURISM REGARDING ITS OPENING STATEMENT OF POSITION AND PROPOSAL FOR FEED-IN TARIFF DESIGN, POLICIES AND PRICING METHODS

AND

CERTIFICATE OF SERVICE

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for The Solar Alliance

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Pursuant to the Commission's Order Approving the HECO Companies' Proposed Procedural Order, as Modified, filed on January 20, 2009, The Solar Alliance hereby submits the following Responses to Information Requests from the HECO Companies and the Department of Business, Economic Development and Tourism on its Opening Statement of Position and Proposal for Feed-in Tariff Design, Policies and Pricing Methods.

Respectfully submitted.

DATED: Honolulu, Hawaii, 3/13 2009.

RILEY SAITO

for The Solar Alliance

HECO/Solar Alliance-IR-1
Do you agree that in addition to achieving a greater level of renewable energy for the State, reliability, power quality and ratepayer impacts are important considerations that must be addressed as a part of any feed-in tariff (FIT) design? If not, please discuss why not.

RESPONSE:

Yes. However, it is important to keep in mind that: (i) a feed-in tariff is a *price* specification designed to economically motivate the rapid development of renewable energy generation and (ii) that a number of factors outside the scope of this proceeding influence reliability, power quality, and ratepayers impacts.

HECO/Solar Alliance-IR-2

Do you agree that the HECO, MECO and HELCO systems have different technical and reliability considerations? If not, please discuss why not.

RESPONSE:

Yes.

HECO/Solar Alliance -IR-3

Do you agree that due to the existing and/or anticipated levels of intermittent renewable resources on each island system, that there may be technical and/or operational constraints upon the amount of additional intermittent renewable energy that each island system can absorb? If not, please discuss why not.

RESPONSE:

Yes, which has resulted in the Section 18 of the HCEI Energy Agreement Page 27, which the parties agreed to address technical and/or operational constraints. Section 18 states, inter alia:

Distributed Generation (DG) and Distributed Energy Storage (DES)

Distributed generation, including biofueled and fossil facilities, combined heat and power, and small renewable technologies such as wind and photovoltaics, can help replace central station generation and improve local grid operations and reliability. Similarly, DES (such as batteries, ice storage systems, flywheels and super-capacitors) can aid in firming intermittent renewables and provide load shifting and peak-shaving capabilities. To support and accelerate the adoption of DG and DES (termed broadly, distributed energy resources), the parties agree to the following:

> 1. The **Hawaiian Electric Companies will facilitate** planning for distributed energy resources through the Clean Energy Scenario Planning process and Locational Value Maps, to identify areas where these resources have system benefits and can be reasonably accommodated. The Locational Value Maps will be completed and become publicly available by December 31, 2009.
>
> 2. **The utilities will support non-utility DG and DES by improving the process and procedure for interconnecting non-utility DG and DES to make it faster, efficient, and more transparent. By June 30, 2009, the Hawaiian Electric utilities will submit a review of the implementation of the Rule 14H tariffs, as amended in May, 2008**.
>
> . . .
>
> 6. To the degree that **transmission and distribution automation and other smart grid technology investments are needed to facilitate distributed energy** resource utilization, **those investments will be recovered through the Clean Energy Infrastructure Surcharge** and later placed in rate base in the next rate case proceeding.
>
> . . .
>
> 9. In order to accept higher levels of DG on the utility grid, significant investment in smart grid technologies and changes in grid operations may be needed. These investments, if demonstrated to be prudent and reasonable, will be recovered through the Clean Energy Infrastructure Surcharge or through the general rate case recovery process. *(Emphasis added.)*

HECO/Solar Alliance-IR-4
How does your FIT proposal insure that reliability and power quality on each island electric system are maintained?

RESPONSE:

PV invertors positively contribute to the feeder voltage regulation and result in an improved voltage profile. At a high enough penetration, PV invertors may be able to provide feeder voltage support. (Additional studies are needed on penetration which will be conducted pursuant to the Hawaii Clean Energy Initiative.) *See,* Distribution System Voltage Performance Analysis for High-Penetration Photovoltaics. NREL/SR-581-42298, February 2008.

HECO/Solar Alliance-IR-5

What specific data, evaluations, studies or analyses did you rely upon as a part of any conclusion that your FIT proposal insures reliability on each island system? Please provide that data, evaluations, studies and/or analyses to the extent they are available.

RESPONSE:

- Distribution System Voltage Performance Analysis for High-Penetration Photovoltaics. NREL/SR-581-42298, February 2008.
- HECO's Ramp Rate Performance Standard for Intermittent Generation on the HECO System, March 14, 2008 at 8-10.
- Big Island Energy Road Map – Status, Terry Surles, Hawaii Natural Energy Institute, October 17, 2007.
- Technology Issues in Renewable Energy and Energy Efficiency, presented to the Hawaii State Legislature by Richard Rocheleau, Hawaii Natural Energy Institute, January 22, 2009.

HECO/Solar Alliance-IR-6
As variable generation is presently having an adverse impact on a system's reliability, how would your FIT proposal mitigate any further adverse impacts?

RESPONSE:

SA does not agree with the assumption posed in this question that "As variable generation is presently having an adverse impact on a system's reliability". As discussed in our response to HECO/Solar Alliance-IR-3, the utility has agreed to facilitate the acceptance of higher levels of DG on the utility grid. See also, our response to HECO/Solar Alliance IR-4 and 5 in support of the proposition that PV has a positive impact on the utility system's reliability.

SA also notes that: (i) it is not clear to which "system" the question refers to and (ii) what the term "system" means in this context (*i.e.*, grid vs. circuit vs. other). Additionally, SA notes that to the extent that "variable generation is presently having an adverse impact on a system's reliability," the question is not phrased in a way that makes it possible for SA to know whether or not its expertise in solar PV is relevant, given that different forms of variable generation have *different relationships with load.*

HECO/Solar Alliance-IR-7

Do you agree that your FIT proposal could result in increases in the rates paid by utility ratepayers? If so, what do you view as an acceptable level of increase for each of the utility system's ratepayers? What do you base that opinion on? Please provide any evaluations or analyses or studies used to support this opinion.

RESPONSE:

No, SA does not agree that its FIT proposal could result in increases in the rates paid by the utility ratepayers. The utility ratepayers may experience an increase in the short-run, but in the long-run (the 20 year term of the FIT contract) the utility ratepayer will experience: (i) stable and set rates; (ii) a decrease in rates, especially if the price of oil keeps rising in the next 20 years; and (iii) economic growth generally because the use of PV will create a "green" industry in the State of Hawaii, thus creating job opportunities in Hawaii and reducing the amount of dollars exported from the state to purchase fossil fuels. Based on the following assumptions:

Hypothertical System Size/Cost/Production

System Size kW	Sun Hours	Deerate	First year Annual kWh	20 year total kWh
10	5.4	0.77	15,177	303,269
100	5.4	0.77	151,767	3,032,686
500	5.4	0.77	758,835	15,163,431
1000	5.4	0.77	1,517,670	30,326,863

"Business as usual" cost of energy was based on 2007 Average Electric Rates for the HECO website. This rate was escalated at 6.5% per year over the 20 life of the FiT contract. Business as usual does not include potential significant lumpy increases due to Decoupling, CEIS, i.e. underwater sea cable, smart grid, etc.....

All the systems are installed in January 1, 2010.

The projected kWh and the projected cents per KWH were multiplied to derive the $ dollar value of the energy produce per year.

Transmission and distribution cost/changes are not considered factors since the Utility will recover these costs via the CEIS and Decoupling.

The result:

Utility	Rate Class	Year the Fit energy cost falls below the utiliy cost	Number of years that FiT Energy cost falls below the utiliy cost

HECO	Residntl	2020	10
	G rate	2019	11
	J Rate	2020	10
	P rate	2020	10
MECO	Residntl	2017	13
	G rate	2015	15
	J Rate	2015	15
	P rate	2015	15
Molokai	Residntl	2016	14
	G rate	2011	19
	J Rate	2013	17
	P rate	2014	16
Lanai	Residntl	2017	13
	G rate	2013	17
	J Rate	2012	18
	P rate	2013	17
HELCO	Residntl	2015	15
	G rate	2012	18
	J Rate	2014	16
	P rate	2014	16

Over the life of the 20 Year FIT agreement all the rate classes would experience a reduced cost of energy versus the utility business as usual cost of energy.

(Workpapers are available upon request.)

HECO/Solar Alliance-IR-8

How does your FIT proposal insure that ratepayers within each of the three utility service territories do not receive significant rate increases?

RESPONSE;

See Response to HECO/Solar Alliance-IR-7.

HECO/Solar Alliance-IR-9

What specific data, evaluations, studies or analyses did you rely upon as a part of any conclusion that your FIT proposal insures that ratepayers within each of the three utility service territories do not receive significant rate increases? Please provide that data, evaluations, studies and/or analyses to the extent they are available.

RESPONSE;

See SA's Exhibit to HECO/Solar Alliance-IR-5 and 7.

HECO/Solar Alliance-IR-10
Do you agree that competitive bidding can provide benefits to ratepayers? If so, how does your proposal insure that ratepayers receive the benefits that competitive bidding can provide?

RESPONSE;

SA cannot take a position on this issue as no solar PV projects have been interconnected via the competitive bidding process.

HECO/Solar Alliance-IR-11
Please explain why a feed in tariff should be applied to larger resources, rather than competitively bid to assure ratepayers the lowest prices for significant blocks of renewable energy?

RESPONSE:

SA notes again that no solar PV projects have been interconnected under the competitive bidding process. It is therefore not clear that competitive bidding would deliver solar energy to ratepayers.

In order to meet the penetration goals of the Hawaii Clean Energy Initiative feed in tariffs must be applied to larger resources because they eliminate the price/award uncertainty of competitive bidding. Relative to competitive bidding, FiT will encourage more PV developers into the market by providing them with a set price, while the uncertainty in competitive bidding raises the cost of capital for the developer and thus the ultimate price to the ratepayer.

HECO/Solar Alliance-IR-12

Do you agree that if a Renewable Energy Generating Facility is unable to meet the technical requirements set forth in the utilities' rules relating to interconnection with the utility's electric system, that Renewable Energy Generating Facility should not be interconnected with the utility's electric system? If not, please discuss why not.

RESPONSE:

Yes, as long as the interconnection rules and requirements are applying best practices; i.e. Interstate Renewable Energy Council's Model Interconnection Standards and Procedures for Small Generator Facilities.

HECO/Solar Alliance-IR-13

Do you agree that, as an electric system must remain in balance, if there is a greater amount of energy being generated in relation to load being served that generation must be reduced or curtailed to achieve system balance (assuming that load cannot be increased)? If not, please describe how the system balance can otherwise be achieved.

RESPONSE:

Yes.

HECO/Solar Alliance-IR-14

Please explain how your proposal to require the utility to take all renewable energy generated by a FIT resource regardless of system need assures system balance and stability?

RESPONSE:

SA's proposal does not require the utility to take all renewable energy generated by a FIT resource regardless of system need assures system balance and stability. The SA proposal does require the utility to pay for all renewable energy generated by a FIT resource regardless of system need assures system balance and stability.

HECO/Solar Alliance-IR-15

Is it your position that FIT resources may not be curtailed under any circumstance? If there are circumstances under which a FIT resource may be curtailed, please explain in detail how that curtailment would be accomplished. Please explain in detail how existing renewable projects fit into any curtailment order and the basis for assigning a lower curtailment priority to existing renewable resources.

RESPONSE:

No.

It is the utilities' decision as to how curtailments will be accomplished. To the extent that curtailment will be based upon the economics of the utilities, SA assumes that the utilities will take into account that under SA's proposal FIT generators will be paid even if they are curtailed.

SA's proposal does not assign a lower curtailment priority to existing renewable resources.

HECO/Solar Alliance-IR-16

Please provide any evaluations, studies or analyses to support the following in your FIT proposal: (1) the inclusion of each renewable resource type; (2) the viability of each renewable resource type for each island system; (3) the project size demarcations for each renewable resource type; (4) the viability of each project size for each island system; and (5) the basis for a different or separate rate for each size demarcation (if applicable). This should include any information or evidence that you may have on the general or specific plans of any renewable resource developer to develop renewable resources of this type, and including the anticipated size of the project, on any island system within the next one, three and five years.

RESPONSE:

Please see response to HECO/Solar Alliance-IR-5.

SA objects to the request for "any information or evidence that you may have on general or specific plans of any renewable resource developer to develop renewable resources of this type, and including the anticipated size of the project, on any island system within the next one, three and five years" because it calls for confidential, proprietary, and trade secret information from its members.

HECO/Solar Alliance-IR-17

Please describe the methodology and rationale used to determine the proposed twenty (20) year terms in your FIT proposal for each technology. Please provide any evaluations, studies or analyses to support the proposed 20 years terms for each technology listed.

RESPONSE:

The proposed twenty (20) year term for PV came from HECO/CA's proposed FIT tariff sheets. Additionally, the 20 year term was used by HECO in its 100MW RFP and the State Department of Transportation in its RFP.

HECO/Solar Alliance-IR-18

Please provide the bases for the proposed penetration limits for intermittent renewable energy sources. Please provide any evaluations, studies or analyses to support the proposed penetration limits, including in particular any evaluations, studies or analyses regarding maintenance of system reliability at the proposed penetration limits.

RESPONSE;

- *See,* Distribution System Voltage Performance Analysis for High-Penetration Photovoltaics. NREL/SR-581-42298, February 2008.

HECO/Solar Alliance-IR-19

Please explain in detail how the proposed queuing procedures based upon those procedures proposed by the Midwest ISO would operate and be implemented for each island electric system. In particular, please provide any evaluations, studies or analyses of potential differences between the Midwest ISO service territory and the Hawaii utility electric systems and how those differences would be accommodated and addressed through your FIT proposal. Please discuss in detail whether the quality of power (steadiness, predictability, ability to enhance regulating resources on the grid and other such characteristic that are important to power reliability) should be a factor in setting the priority a project receives, and if not, why not.

RESPONSE:

The Midwest ISO queuing procedure[1] could operate and be implemented for each island electric system without significant modification.

Power quality and power reliability are factors affecting whether a project meets the utility's technical requirements for interconnection and, therefore, whether it is "ready-to-interconnect," but should not themselves be a factor in determining the priority that a project receives under the utility's queue management procedure for interconnection.

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[1] *See* Midwest Independent Transmission System Operator ("Midwest ISO"), Generator Interconnection Process Tariff (August 25, 2008) http://www.midwestmarket.org/publish/Document/25f0a7_11c1022c619_-7d600a48324a/Attachment%20X%20GIP.pdf?action=download&_property=Attachment; Midwest ISO, Business Practices Manual: Generator Interconnection (Manual No. 15, TP-BPM-004-r2, January 6, 200p) http://www.midwestmarket.org/publish/Document/45e84c_11cdc615aa1_-7e010a48324a ; 124 FERC ¶ 61,183, Midwest Independent Transmission System Operator, Inc., Docket No. ER08-1169-000, Order Conditionally Accepting Tariff Revisions and Addressing Queue Reform (August 25, 2008) http://elibrary.ferc.gov/idmws/doc_info.asp?document_id=13641108; Working group for Investment in Reliable & Economic electric Systems (WIRES), Integrating Locationally-Constrained Resources Into Transmission Systems: A Survey of U.S. Practices (October 2008) http://www.wiresgroup.com/images/WIRES_Report_LCR.pdf

HECO/Solar Alliance-IR-20

Should a utility be entitled to use the generated output of a renewable resource in its service territory toward meeting a state or county mandated RPS standard regardless of ownership of the environmental credits? If not, please discuss why not?

RESPONSE:

SA is not the governing body to determine entitlement of the generated output of a renewable resource toward the mandated RPS. However, it should be noted that the FIT proposed by SA will provide a lower cost of energy generation to the utility, compared to "business as usual cost" (HECO/Solar Alliance-IR-7) over the life of the agreement, (20 years), and thus the proposed PV FIT rates do not include compensation for the RECs.

HECO/Solar Alliance-IR-21
Please provide any evaluations, studies, analyses or data to support the rates contained in your FIT proposal including detailed support for the applicability of those rates to the specified resources on the Hawaii utilities' island systems.

RESPONSE:

SA's proposed FIT rates are based on investor/financier's acceptance of FiT rates that would result in an 20 year commitment. There has been discussions/question regarding the cost plus + reasonable profit as a method, but at the end of the day, the FIT rates needs to be at a level that will trigger the investment. The State of Hawaii recently execute power purchase agreements for ten sites across the State on three islands. The investor was able to commit to these rates without utilizing the State's REITC. See table below

Executed Third Party Financed PV Projects (No State Tax Credit)											
Location	PV System Size	Baseline rate $/kWh	Annual Escalation	Average Rate over 20 years	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Kauai- Ariport	154	0 38	2%	0 4617	100 to 500	$ 0 396	$ 0 436	$ 0 475	$ 0.475	$ 0.444	
Kauai- Ariport	112	0 38	2%	0 4617	100 to 500	$ 0 396	$ 0 436	$ 0 475	$ 0.475	$ 0 444	
Kauai- Ariport	35	0 38	2%	0 4617	11 to 100	$ 0 436	$ 0 479	$ 0 523	$ 0.523	$ 0 488	
Kauai- Ariport	35	0 38	2%	0 4617	11 to 100	$ 0 436	$ 0 479	$ 0 523	$ 0.523	$ 0 488	
Kauai-Highways	98	0 38	2%	0 4617	11 to 100	$ 0 436	$ 0 479	$ 0 523	$ 0.523	$ 0 488	
Kauai - Harbors	30	0 38	2%	0 4617	11 to 100	$ 0 436	$ 0 479	$ 0 523	$ 0.523	$ 0 488	
Hilo Airport	112	0 33	3%	0 4434	100 to 500	$ 0 396	$ 0 436	$ 0 475	$ 0.475	$ 0 444	
Kona Airport	60	0 32	3%	0 4299	11 to 100	$ 0 436	$ 0 479	$ 0 523	$ 0.523	$ 0 488	
Kahului - Airport	112	0 32	3%	0 4299	100 to 500	$ 0 396	$ 0 436	$ 0 475	$ 0.475	$ 0 444	
Kahului - Airport	31	0 32	3%	0 4299	11 to 100	$ 0 436	$ 0 479	$ 0 523	$ 0.523	$ 0 488	

SA's proposed FIT rates is levelized for 20 twenty years with no escalation. The third party financed rates start lower and escalate over the life of the agreement. In order to provide some degree of comparison, the "Average Rate over 20 years" column reflects the average of the escalated rates for twenty year. The green labeled section is the proposed FiT rates for the relative system size. The proposed SA FiT rates is definitely within reason, (some above/some below) the third party financed contracts that the State of Hawaii has signed.

Also in support of SA's proposed FIT rates is the following article:

Ontario Proposes Precedent-Setting Renewable Tariffs

World Class Solar Tariffs for North America
March 12, 2009

By Paul Gipe

(Toronto, Ontario) Ontario's Minister of Energy and Infrastructure, George Smitherman, announced today that the Ontario Power Authority (OPA) will be establishing a system of feed-in tariffs as a result of the pending Green Energy and

Green Economy Act.

Minister Smitherman also released OPA's proposed tariffs for a host of renewable energy technologies.

If implemented, the package of tariffs will represent the first application of Advanced Renewable Tariffs in North America. The system of feed-in tariffs envisioned by Minister Smitherman is a Canadian version of the successful policies used in Germany, France, Spain, and several other European countries.

OPA will begin public consultation on the tariffs and elements of the program March 17th and will continue hearings for the next seven weeks.

The tariffs are precedent setting in North America not only for the number of different technologies listed, including offshore wind, but also for the prices offered.

Solar energy advocates will be particularly pleased. Ontario's proposed tariffs, if implemented, will be the highest in North America. For rooftop solar they will be comparable to those offered in Germany and France. On the other hand, Ontario's proposed tariffs for ground-mounted systems will be less than those in Germany, a country with a comparable solar resource.

OPA's press release suggested that the tariff for residential rooftop solar PV could result in 100,000 solar installations capable of generating one percent of Ontario's electricity supply. One percent of Ontario's supply is 1.5 TWh or nearly one-third the 2008 solar generation in Germany, the world's leader in solar energy.

Similarly, the tariffs for biogas plants will be among the highest, if not the highest on the continent. Unlike higher tariffs offered by some utilities in Wisconsin, Ontario's proposed tariffs are for 20-year contracts. The tariffs offered in Wisconsin are paid only for ten years.

The wind tariffs proposed are less robust than expected. The tariffs for onshore wind are nearly identical to those proposed by the Ontario Sustainable Energy Association in 2005. Since that time, the installed cost of wind turbines has increased substantially.

The proposed wind tariffs are comparable to those in France, but substantially less than those in Germany. And unlike in Germany

and France, the tariffs are not differentiated by resource intensity.

OPA proposes two wind tariffs, one for community wind projects, another tariff for everything else. OPA does not differentiate the tariffs further.

In another first in North America, OPA has proposed a specific tariff for offshore wind. Ontario fronts four of the Great Lakes: Superior, Huron, Erie, and Ontario. Consequently, Ontario has a huge offshore wind resource.

Currently, there are no wind turbines in any of the Great Lakes, though there are several proposals for projects in waters off Ontario.

The tariffs proposed by OPA represent the total payment for renewable energy. There are no federal or provincial subsidies for renewable electricity generation in Ontario.

While several US states have rudimentary feed-in tariffs, often with contracts of limited length, no US state has as comprehensive a system of feed-in tariffs as that proposed by OPA. Nor does any state in the US pay as high tariffs as those proposed in Ontario, in part because of lucrative US federal tax subsidies.

Ontario Ministry of Energy's Proposed Renewable Energy Tariffs
2009

12-Mar-09

	Years	1.649 €/kWh	$CAD/kWh	0.777 USD/kWh
Wind				
Onshore	20	0.0819	0.135	0.105
Offshore	20	0.1152	0.190	0.148
Community-based <10 MW	20	0.0873	0.144	0.112
Photovoltaics				
Rooftop <10 kW	20	0.4864	0.802	0.623
Rooftop >10 kW<100 kW	20	0.4325	0.713	0.554
Rooftop >100 kW<500 kW	20	0.3851	0.635	0.494
Rooftop >500 kW	20	0.3269	0.539	0.419
Groundmounted <10 MW	20	0.2687	0.443	0.344
Hydro				
<50 MW	20	0.0782	0.129	0.100
Community-based <2 MW	20	0.0813	0.134	0.104
Landfill Gas				
<5 MW	20	0.0673	0.111	0.086
>5 MW	20	0.0625	0.103	0.080
Biogas				
<5 MW	20	0.0892	0.147	0.114
>5 MW	20	0.0631	0.104	0.081
Biomass				
Any size	20	0.0740	0.122	0.095

HECO/Solar Alliance-IR-22
Please explain how your proposed rates are affected by the key costs and operating characteristics referenced in the Commission's NRRI Scoping Paper filed December 11, 2008.

RESPONSE:

The key costs and operating characterics referenced in the Commission's NRRI Scoping Paper were taken into consideration in establishing SA's proposed rates. However, the factor that had the most significant was what rate would encourage investors to invest in PV energy in Hawaii.

DBEDT-IR-1-Solar Alliance: Ref. Schedule FIT, Pages 4-9.

Please provide all the workpapers and data used to determine the proposed feed-in tariff rates in the referenced pages.

RESPONSE:

See Response to HECO/Solar Alliance-IR-21.

CERTIFICATE OF SERVICE

The foregoing Responses to Information Requests were served on the date of filing by hand delivery or electronically transmitted to the following Parties:

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DATED: Honolulu, Hawaii, 3/13 2009.

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